

BULLETIN

OF THE INSTITUTE OF METALS

VOLUME 2

FEBRUARY 1955

PART 18

INSTITUTE NEWS

May Lecture 1955

The 1955 May Lecture will be given at 7.0 p.m. on Tuesday, 29 March at the Royal Institution by Professor F. C. FRANK, O.B.E., D.Phil., F.R.S., of the University of Bristol. The subject of his lecture will be the nature of the real crystal.

Spring Meeting : Location of Conversazione

As extensive decorations to both the outside and interior of the building are to be made, the rooms at 4 Grosvenor Gardens will not be available for the Conversazione and Exhibition on 30 March; this function will now be held at the Institute of Physics, 47 Belgrave Square, S.W.1.

1956 Autumn Meeting in Germany

The Council has gratefully accepted an invitation from the Deutsche Gesellschaft für Metallkunde to hold the Institute's 1956 Autumn Meeting in Germany.

Election of Council for 1955-56

The following members have been declared elected to fill vacancies on the Council and will take office after the Annual General Meeting on 30 March 1955:

As President :

MAURICE COOK, D.Sc., Ph.D., F.I.M., Joint Managing Director, Imperial Chemical Industries, Ltd., Metals Division, Birmingham.

As Past-President :

S. F. DOREY, C.B.E., D.Sc., F.R.S., M.I.C.E., M.I.Mech.E., Chief Engineer Surveyor, Lloyd's Register of Shipping, London.

As Vice-Presidents :

E. H. JONES, A.R.I.C., M.I.M.M., F.I.M., Joint Managing Director, Capper Pass and Son, Ltd., Bristol.

W. J. THOMAS, M.I.Mech.E., M.I.E.E., Joint Managing Director, The British Aluminium Co., Ltd., London.

As Honorary Treasurer :

J. C. COLQUHOUN, M.B.E., Chairman and Managing Director, The Manganese Bronze and Brass Co., Ltd., London.

As Ordinary Members of Council :

L. E. BENSON, M.Sc., F.I.M., Metallurgist, Metropolitan-Vickers Electrical Co., Ltd., Manchester.

C. F. J. FRANCIS-CARTER, O.B.E., F.R.I.C., M.I.Chem.E., F.I.M., General Manager, Aluminium Wire and Cable Company, Ltd., Swansea.

D. P. C. NEAVE, M.A., M.I.Mech.E., Vice-Chairman and Joint Managing Director, Consolidated Zinc Corporation, Ltd., London.

Professor H. O'NEILL, M.Met., D.Sc., F.I.M., Professor of Metallurgy, University College, Swansea.

Metallurgical Reviews: Executive Committee

The Council has appointed the following to be members of the Executive Committee responsible for the publication of the new quarterly periodical *Metallurgical Reviews*:

JENKINS, Dr. Ivor (Chief Metallurgist, Research Laboratories, The General Electric Co., Ltd., Wembley), *Chairman*.

BAKER, Dr. W. A. (Research Manager, The British Non-Ferrous Metals Research Association, London).

CHASTON, Dr. J. C. (Manager, Research Laboratory, Johnson, Matthey and Co., Ltd., Wembley).

FORD, Professor H. (Professor of Applied Mechanics, Imperial College of Science and Technology, London).

GADD, Mr. E. R. (Chief Metallurgist, Engine Division, The Bristol Aeroplane Co., Ltd., Bristol).

HOAR, Dr. T. P. (Lecturer, Department of Metallurgy, University of Cambridge).

NORTHCOTT, Dr. L. (Deputy Chief Scientific Officer, Armament Research Establishment, Ministry of Supply, Fort Halstead). *Representing the Institution of Metallurgists*.

RAYNOR, Professor G. V. (Professor of Physical Metallurgy, University of Birmingham).

SALTER, Mr. J. (Production Manager (Manufactured Products), The British Aluminium Co., Ltd., London).

SCHEUER, Dr. E. (Chief Metallurgist and Head of the Laboratories, International Alloys, Ltd., Aylesbury).

SMITH, Mr. Christopher (Works Superintendent, James Booth and Co., Ltd., Birmingham).

SMITH, Mr. S. S. (Research Manager, Imperial Chemical Industries, Ltd., Metals Division, Birmingham).

Ex-officio :

DOREY, Dr. S. F. (Chief Engineer Surveyor, Lloyd's Register of Shipping, London).

COLQUHOUN, Mr. J. C. (Chairman and Managing Director, The Manganese Bronze and Brass Co., Ltd., London).

JONES, Mr. E. H. (Joint Managing Director, Capper Pass and Son, Ltd., Bristol).

INSTITUTE NEWS

Representation on the General Board of the National Physical Laboratory

Dr. MAURICE COOK, F.I.M., Senior Vice-President, has been nominated by the Council as one of the Institute's representatives on the General Board of the National Physical Laboratory with effect from 1 January 1955, in place of Professor A. J. Murphy, M.Sc., F.I.M., Past-President, whose term of service has expired and who is not immediately eligible for re-election.

The Institute's other representative is MAJOR C. J. P. BALL, D.S.O., M.C., F.R.Ae.S., Vice-President.

University of Nottingham

Mr. T. HENRY TURNER has been appointed as representative of the Institute on the Engineering Advisory Committee of the University of Nottingham.

Election of Members

The following 22 Ordinary Members, 3 Junior Members, and 29 Student Members were elected on 31 December 1954:

As Ordinary Members

- ALJANATI, Daniel, Quím. Indust., Químico de Administración Nacional de Combustibles, Alcohol y Portland (ANCAP), La Teja, Montevideo, Uruguay.
- ARMSTRONG, Sydney, Works Manager, Britannic Alloys, Ltd., Stowmarket, Suffolk.
- BLAKE, James, Proprietor, James Blake and Company, Sheet Metal Workers, 9-13 South Fort Street, Leith, Edinburgh.
- BOLTON, John Pilkington, B.Sc., 2nd Lieutenant, M.T.O., R.E.M.E., 1 INF Workshop, R.E.M.E., M.E.L.F. 27.
- CHANNON, Stanley Lyall, B.Met.E., M.S., Ph.D., Research Metallurgical Engineer, Department of Metallurgical Research, Kaiser Aluminum and Chemical Corp., Spokane 69, Wash., U.S.A.
- COMINS, Harold Ernest, A.I.M., Chief Metallurgist, Ruston and Hornsby, Ltd., Lincoln.
- FETZER, Maurice Charles, Met.E., Sc.D., Head, Section of Physical Metallurgy, Department of Metallurgical Research, Kaiser Aluminum and Chemical Corp., Spokane 69, Wash., U.S.A.
- FORBES, John Stuart, B.Sc., F.R.I.C., Deputy Warden, Assay Office, Goldsmiths' Hall, Foster Lane, London, E.C.2.
- GREEN, Robert Boyce, B.S.E., S.M., Sc.D., Head, Department of Physical Research, Baker and Company, Inc., 113 Astor Street, Newark 5, N.J., U.S.A.
- HATCH, Gerald Gordon, B.Eng., D.Sc., Plant Superintendent, Quebec Iron and Titanium Corp., P.O. Box 40, Sorel, P.Q., Canada.
- HENRARD, Charles, Ing.civ.mét., Ingénieur, Société Solvay et Cie., 33 rue Prince Albert, Ixelles, Belgium.
- MCCAULEY, Charles Warren, B.S., Supervisor of Methods, Revere Copper and Brass, Inc., Baltimore Division, 1301 Wicomico Street, P.O. Box 2075, Baltimore, Md., U.S.A.
- MCLAIN, C. Donald, B.S., Chief Technical Adviser, Olin-Mathieson Chemical Corp., Metals Division, East Alton, Ill., U.S.A.
- MOOKERJEE, Monindra Kumar, Senior Master Welder, Central Training Institute for Instructors, Government of India, Ministry of Labour, D.G.R. & E., Koni, Bilaspur, M.P., India.

NISBET, James D., B.S., Director of Research and Development, Universal-Cyclops Steel Corp., Bridgeville, Pa., U.S.A.

NIXON, Walter Robert, Inspector-in-Charge, Ministry of Supply, Aeronautical Inspection Directorate, J. Stone and Co. (Charlton), Ltd., Charlton, London, S.E.7.

PARKER, Anthony Key, M.A., Deputy to the Public Relations Officer, The Mond Nickel Co., Ltd., Thames House, Millbank, London, S.W.1.

PURDY, Samuel Moreau, B.S., Metallurgist, The Carpenter Steel Company, Reading, Pa., U.S.A.

RAGONE, David Vincent, Sc.D., Assistant Professor of Metallurgy, University of Michigan, Ann Arbor, Mich., U.S.A.

SCULLY, Arnold, Plant Metallurgist, Noranda Copper and Brass, Ltd., Durocher Street, Montreal East, P.Q., Canada.

SEN, Siva Prosad, Foreman-in-Charge, Ferrous and Non-Ferrous Foundries, Pattern Shops, Garden Reach Workshops, Ltd., 43-46 Garden Reach, Calcutta 24, India.

SUMERLING, Roy Thomas, Assistant Metallurgist, De Havilland Propellers, Ltd., Hatfield, Herts.

As Junior Members

HUGHES, David Frederick, Assistant Metallurgist, Hoover (Washing Machines), Ltd., Pentrebach, Merthyr Tydfil, Glamorgan.

MASLIN, William Harold, Laboratory Assistant, Aluminium Wire and Cable Co., Ltd., Port Tennant, Swansea.

STUBBINGTON, Cyril Arthur, L.I.M., Assistant Experimental Officer, Metallurgy Department, Royal Aircraft Establishment, Farnborough, Hants.

As Student Members

ARDMONGON, Saksit, Student, King's College, Durham University, Newcastle-on-Tyne.

BEEVERS, Christopher John, Undergraduate, Department of Metallurgy, University of Sheffield.

BRADBURY, Brian Tatterson, Undergraduate, Department of Metallurgy, University of Sheffield.

CHAKRABARTI, Sailendra Krishna, B.Sc., Metallurgical Apprentice, Metal and Steel Factory, Ishapore, India.

COOK, Peter James, Undergraduate, Department of Metallurgy, University of Sheffield.

DIXON, Michael, Undergraduate, Department of Metallurgy, University of Cambridge.

ELLIOTT, Roy, 3 Stonehead Street, Moston, Manchester 9.

GRAHAM, Stuart Walter, Student of Metallurgy, Constantine Technical College, Middlesbrough.

GREGSON, Michael David Alan, Undergraduate, Department of Metallurgy, University of Cambridge.

HAILE, Ian, Undergraduate, Department of Metallurgy, University of Sheffield.

HARPER, John Duncan, Undergraduate, University of Cambridge.

HAYES, David John, B.Sc., Research Assistant, Bristol Aeroplane Co., Ltd., Engine Division, Patchway, near Bristol.

HUTCHINSON, Robert Ian, Undergraduate, Department of Metallurgy, King's College, University of Durham, Newcastle-on-Tyne.

MEAD, Terrence Clive, Undergraduate, Department of Metallurgy, University College, Swansea.

MEADOWS, Brian John, L.I.M., Assistant Metallurgist, Joseph Lucas (Electrical), Ltd., Shaftmoor Lane, Hall Green, Birmingham 28.

PERSONAL NOTES

- MITCHELL, William Iain, Undergraduate, Department of Metallurgy, University of Cambridge.
- NUTTER, Norman Robert, Undergraduate, University of Manchester.
- REISWIG, Robert David, M.S., Research Fellow, College of Engineering, Department of Mining and Metallurgy, University of Wisconsin, Madison, Wis., U.S.A.
- ROBERTS, Elwyn, Undergraduate, Department of Metallurgy, University of Sheffield.
- SELLARS, Christopher Michael, Undergraduate, Department of Metallurgy, University of Sheffield.
- SENTANCE, William Thomas Wulfram, Student, Royal School of Mines, Prince Consort Road, London, S.W.7.
- SIDEBOTTOM, Barrie Armitage, Undergraduate, Department of Metallurgy, University of Sheffield.
- SIMON, John Russell, Assistant Metallurgist, Welsh Tinplate and Metal Stamping Company, Ltd., Llanelly, South Wales.
- SIMPSON, Roy, Metallurgist, Garringtons, Ltd., Bromsgrove, Worcs.
- WHEATLEY, John Maurice, B.A., Research Student, Department of Metallurgy, University of Cambridge.
- WILSON, Eric George, Undergraduate, Department of Metallurgy, University of Sheffield.
- WINTERBORNE, Reginald Eric, Undergraduate, Department of Metallurgy, University of Sheffield.
- WOOD, Barrie, Research Assistant, British Non-Ferrous Metals Research Association, 81-91 Euston Street, London, N.W.1.
- WORTHINGTON, Gordon Selby, Pyrometrical Laboratory Technician, J. B. and S. Lees, Ltd., Albion Road, West Bromwich, Staffs.
- MR. A. P. MIODOWNIK, of Battersea Polytechnic, has been awarded the Ph.D. degree of London University.
- DR. HUGH MUIR has resigned his post as Senior Lecturer in Metallurgy at the University of Otago to become Senior Lecturer in Physical Metallurgy at Melbourne University.
- DR. L. NORTHCOTT has been appointed Deputy Chief Scientific Officer and Senior Superintendent of Applied Research at the Armament Research Establishment, Fort Halstead.
- MR. M. D. PAYNE has been appointed Metallurgist to Engineering Productions, Ltd., Cleveden, Som.
- DR. V. A. PHILLIPS has now left the British Non-Ferrous Metals Research Association to take the position of Senior Metallurgist in the Chemical and Metallurgical Section of the English Electric Co., Ltd., Luton, Beds.
- MR. H. J. ROSS has been appointed Plant Manager, Kaiser Aluminum and Chemical Corp., Halethorpe, Md.
- MR. J. C. RUCKMAN has left the Atomic Energy Research Establishment, Harwell, and taken a post in the Titanium Section of Imperial Chemical Industries, Ltd., Metals Division.
- MR. P. N. VERNON is now a metallurgist in the Research Laboratories of British Insulated Callender's Cables, Ltd., Shepherds Bush.
- DR. W. H. J. VERNON has been selected by the National Association of Corrosion Engineers to receive its Willis Whitney Award for 1955. This award is made annually for achievements in the field of corrosion science.
- DR. R. J. WASILEWSKI has left Edibrac, Ltd., and is now a Lecturer in Metallurgy at Liverpool University.

PERSONAL NOTES

MR. I. C. BONHAM has left Leeds University and taken an appointment with the Rhokana Corporation, Ltd., Nkana, Northern Rhodesia.

DR. R. W. CAHN has returned to Birmingham University after a year spent as Visiting Lecturer at the Johns Hopkins University, Baltimore, Md.

DR. MAURICE COOK has been elected Chairman of the British Non-Ferrous Metals Research Association, in succession to the Hon. R. M. Preston.

MR. H. H. HALLETT has left Sheepbridge Engineering Ltd., to take up the appointment of Managing Director to Chamberlin and Hill, Ltd., Chuckery Foundry, Walsall.

DR. E. S. HEDGES has been appointed Director of the International Tin Research Council and Director of the Tin Research Institute, in succession to Mr. John Ireland, who retired at the end of 1954.

DR. W. E. HOARE has been appointed an Assistant Director of the Tin Research Institute.

MR. D. GORDON JONES has been appointed Technical Representative of The Mond Nickel Co., Ltd., in South Africa and the Rhodesias.

MR. W. R. LEWIS has been appointed an Assistant Director of the Tin Research Institute.

PROFESSOR R. MADDIN, Visiting Lecturer in Metallurgy at Birmingham University during 1954, has now returned to the Johns Hopkins University, Baltimore, Md.

OBITUARY

Mr. N. F. S. Hubbard

With the death of Norman Frederick Septimus Hubbard on 16 May 1954, metallurgical circles in Manchester lost a well-known figure.

Born in 1889, Mr. Hubbard was educated at Brighton School and later graduated from the Victoria University of Manchester in 1911. Early in that year, he took up a post with the Broughton Copper Company, Manchester, as metallurgist, and remained there (the company being later absorbed into the Metals Division of Imperial Chemical Industries, Ltd.) until his retirement in November 1951.

During the 1914-18 war he served as a pilot in the Royal Flying Corps for a period of almost three years.

He was an early member of the Manchester Metallurgical Society, which was formed in 1919, and served on the Council for sixteen years. During the Second World War he was Acting President of the Society for six years and was its elected President in 1945-46. He joined the Institute of Metals in 1910.

Mr. Hubbard was a man of intellectual pursuits and artistic inclination, deeply interested in philosophy and very knowledgeable about water-colour painting. By nature friendly and kindly, he was a helpful and understanding colleague who earned the affection of all those who worked with him.

He is survived by his widow and two children.

E. D.

Some Aspects of Creep

NEWS OF LOCAL SECTIONS AND ASSOCIATED SOCIETIES

Leeds Metallurgical Society

Dr. P. FELTHAM has been appointed Honorary Secretary of the Leeds Metallurgical Society. His address is the Department of Metallurgy, The University, Leeds 2.

London Local Section

At the annual meeting of the Section held at the Royal School of Mines, London, S.W.7, on 4 November 1954, Professor A. G. QUARRELL (University of Sheffield) dealt with :

Trends in Metallurgy

He said that one of the most important of present-day trends was the emergence of metallurgy the science as distinct from metallurgy the technology. He strongly deprecated the tendency to regard the science of metals as a separate study divorced from metallurgical practice, for he felt that the greatest progress was made in any technology when most advanced discoveries were gradually assimilated into the subject. The technologists, too, had much to offer, for in applying existing knowledge for the benefit of mankind they had acquired much information which, properly sifted and interpreted must increase our understanding of metals.

Other trends discussed were the increased employment of metallurgists by users of metals, the tendency to regard techniques as ends in themselves and not merely methods for acquiring new knowledge, and specialization in University education. If the gap between fundamental research on the one hand and metallurgical practice on the other was to be removed, men were required who had had a broad metallurgical education, not a specialized one. In modern degree courses descriptive metallurgy should be reduced to a minimum, the emphasis should be on underlying scientific principles throughout, and the students should learn of the most advanced lines of work and be encouraged to be receptive of new ideas when they entered the metallurgical industry.

Professor Quarrell went on to discuss a number of aspects of metallurgical education, including full-time day courses provided in the University of Sheffield for outstanding men who had hitherto obtained their metallurgical education by part-time study. He also referred to the way in which, in recent years, University research work had tended to become more fundamental; equipment was available on a more generous scale than a few years ago, and there was a tendency to build up research teams co-operating on broad topics. He illustrated the tendency for University research to be influenced by industrial problems by giving a brief account of two researches on different aspects of creep. The first was concerned with the constitution and composition of carbides formed in ferritic steels and the second with the intercrystalline cracking of an aluminium-manganese alloy and the manner in which fracture was influenced by temperature and rate of straining.

South Wales Local Section

At a meeting of the Section held on 9 November 1954, at University College, Swansea, Dr. J. P. DENNISON, Lecturer in Metallurgy at University College, gave a paper entitled :

A brief review was given of the development of both the theoretical and the practical approaches to the problem of metallic creep. The various fields of work were summarized, and the opinion was expressed that an undue proportion of the attention of scientific workers had possibly been devoted to the study of pure metals, which might show phenomena not observed in industrial alloys.

The effects of stress and temperature on the mode of deformation during creep were illustrated, with particular emphasis on metallographic features. It was pointed out that the physical theory of creep as applied to metals in service is largely qualitative. Slides were shown illustrating the effects of variation of factors such as alloying elements, pre-strain, and heat-treatment, on the creep behaviour of such materials.

In conclusion, an account was given of the work at present being carried out in the Metallurgy Department of University College, Swansea, on the creep behaviour of precipitation-hardening alloys. Experimental results were described which showed that certain types of precipitation, although reducing the creep rate, greatly increased susceptibility to fracture, whilst the presence of certain atoms with a high degree of lattice misfit in solid solution might confer a high resistance to the usual type of intercrystalline failure encountered in long-time creep tests.

At a meeting held on 7 December 1954, DR. A. B. MCINTOSH gave a lecture on :

Peace-Time Uses of Atomic Energy

He began with a simple explanation of the process of fission and then dealt with the basis of a chain reaction. In developing atomic power, the importance of regeneration and breeding of atomic fuels was emphasized, and the equivalence shown in coal and power for chosen systems. Possible power installations were described. The lecture concluded with an account of radio-isotopes and their applications.

JOINT ACTIVITIES

Mond Nickel Fellowships, 1954

The Mond Nickel Fellowships Committee announces the following awards for 1954:

M. BROWNLEE (Dorman, Long and Co., Ltd.) to study British, Continental, and American hot- and cold-metal basic open-hearth steelmaking, with particular reference to furnace design and construction and factors affecting ingot quality.

R. D. BUTLER (Imperial Chemical Industries, Ltd.) to study mineral-dressing practice in Great Britain, on the Continent, and in the U.S.A. and Canada, with particular reference to the design, layout, and operation of small-scale mills.

F. B. PEACOCK (Dorman, Long and Co., Ltd.) to study rolling-mill operation and maintenance, with particular reference to soaking pits, blooming mills, and the production of universal beams, structural sections, and rails.

A. M. SAGE (British Iron and Steel Research Association) to study the manufacture and fabrication of structural steels in the United Kingdom, Europe, U.S.A., and Canada.

DIARY

Local Sections and Associated Societies

- 21 February.** **Sheffield Local Section.** "Recent Developments in Colour Television", by L. C. Jesty. (University Buildings, St. George's Square, Sheffield, at 7.30 p.m.)
- 22 February.** **North East Metallurgical Society.** "Plain Bearing Metals", by P. T. Holligan. (Cleveland Scientific and Technical Institution, Middlesbrough, at 7.15 p.m.)
- 23 February.** **Manchester Metallurgical Society.** "Brittle Fracture", by T. S. Robertson. (Lecture Room, Central Library, Manchester, at 6.30 p.m.)
- 24 February.** **Birmingham Local Section.** "Current Work of the British Non-Ferrous Metals Research Association", by G. L. Bailey. (James Watt Memorial Institute, Great Charles Street, Birmingham 3, at 6.30 p.m.)
- 1 March.** **Oxford Local Section.** "Plutonium: Some Properties and Handling Problems", by Dr. W. B. H. Lord. (Cadena Café, Cornmarket Street, Oxford, at 7.0 p.m.)
- 3 March.** **Birmingham Local Section.** "Recent Developments in Stainless Steels", by J. I. Morley. (James Watt Memorial Institute, Great Charles Street, Birmingham 3, at 6.30 p.m.)
- 3 March.** **London Local Section.** "Physical and Chemical Processes Occurring in the Electrolytic Production of Aluminium", by Dr. T. G. Pearson. (Meeting place to be announced later.)
- 7 March.** **Sheffield Local Section.** "The Place of Shell Moulding in the Foundry", by Dr. B. H. C. Waters. Joint Meeting with the Sheffield Branch, Institute of British Foundrymen. (College of Technology, Pond Street, Sheffield, at 7.15 p.m.)
- 8 March.** **South Wales Local Section.** "Industrial Methods of Electroplating", by Dr. G. E. Gardam. (Metallurgy Department, University College, Singleton Park, Swansea, at 6.30 p.m.)
- 9 March.** **Liverpool Metallurgical Society.** "Siliceous Refractories", by Dr. G. B. Rigby. Joint Meeting with the North Wales Metallurgical Society. (The County Primary School, Plymouth Street, Shotton, at 7.0 p.m.)
- 9 March.** **Manchester Metallurgical Society.** "Some Metallurgical Problems Imposed by Stratospheric Flight", by Major P. Litherland Teed. (Lecture Room, Central Library, Manchester, at 6.30 p.m.)
- 10 March.** **Liverpool Metallurgical Society.** "Tube Manufacture", by E. Davis. (Liverpool Engineering Society, The Temple, Dale Street, Liverpool, at 7.0 p.m.)
- 14 March.** **Scottish Local Section.** "Post-War Light-Alloy Production", by F. Kasz. Followed by the Annual General Meeting. (Institution of Engineers and Shipbuilders in Scotland, 39 Elmbank Crescent, Glasgow, C.2, at 6.30 p.m.)

Other Societies

- 25 February.** **Institute of Welding, Birmingham Branch.** "The Inspection and Testing of Welds", by A. H. Goodger. (Birmingham and Midland Institute, Paradise Street, Birmingham 1, at 7.30 p.m.)
- 25 February.** **Institute of Welding, South London Branch.** "Fundamentals of Welding": "Fusion Welding", by V. W. Clack; "Resistance Welding", by H. E. Dixon. (Kingston Technical College, at 7.0 p.m.)

- 2 March.** **Institute of Welding, Manchester Branch.** "Some Welding Problems in the Chemical Industry", by E. J. Heeley. (College of Technology, Manchester, at 7.15 p.m.)
- 7 March.** **Institute of Welding, Sheffield Branch.** "The Place of Radioactive Isotopes in Non-Destructive Testing", by G. F. Gribbin and R. S. Forbes. (Sheffield College of Commerce and Technology, at 7.15 p.m.)
- 10 March.** **Institute of Welding, South London Branch.** "The Plural Welding Process", by M. Lebrun. (2 Savoy Hill, London, W.C.2, at 6.30 p.m.)
- 10 March.** **Institute of Welding, South-Western Branch.** "Titanium—Welding and Other Joining Methods", by D. C. Moore. (Bristol Aeroplane Co., Ltd., Weston-super-Mare.)
- 11 March.** **Institute of Welding, Eastern Counties Branch.** "The Economics of Welding", by H. Martin. Joint Meeting with the Lincoln Engineering Society. (Victoria Station Hotel, Nottingham, at 7.15 p.m.)
- 15 March.** **Institute of Fuel, Midland Section.** "Selection and Use of Fuels in a Modern Engineering Heat-Treatment Department", by H. Oxley. (James Watt Memorial Institute, Great Charles Street, Birmingham 3, at 6.0 p.m.)
- 15 March.** **Institution of Structural Engineers, Wales and Monmouthshire Branch.** "Cathodic Protection of Steel Structures", by A. C. Vivian. (South Wales Institute of Engineers, Park Place, Cardiff, at 6.30 p.m.)
- 15 March.** **Royal Aeronautical Society.** "The Production of Large Forgings", by C. Smith and J. Crowther. (The Library, 4 Hamilton Place, London, W.1, at 7.0 p.m.)

APPOINTMENTS VACANT

ALUMINIUM DEVELOPMENT ASSOCIATION requires a qualified Metallurgist for work in the General Metallurgy Department, which includes carrying out investigations into new applications of aluminium and its alloys, particularly with reference to welding, answering technical enquiries, and preparing reports and reviews. Applicants should be graduates in metallurgy or hold the Institution's qualifications with some industrial or laboratory experience: commencing salary will be according to qualifications and experience. Applications, giving full details, should be sent to the Technical Director at 33 Grosvenor Street, London, W.1.

METALLOGRAPHER with experience in the metallography of non-ferrous metals and alloys. Applicants should be capable of producing first-class preparations and able to explore new techniques for polishing, etching, and examination. Also **RESEARCH METALLURGIST** for work on new and rapidly developing bearing alloys. Applicants should be well qualified and have had some research experience. The positions are permanent and progressive and carry F.S.S.U. benefits. Full details, including age, experience, qualifications, and salary required to: The Tin Research Institute, Fraser Road, Perivale, Greenford, Middx.

PHYSICAL METALLURGIST is required by Imperial Smelting Corporation, Ltd., for laboratory investigational work on alloys. This is a Senior Staff appointment in the Research Laboratory of the Organization, and applicants should possess a degree in Metallurgy or equivalent qualification and not less than one year's industrial experience in Physical Metallurgy work. Commencing salary will be dependent on individual qualifications and experience, and applications should be submitted to Personnel Manager, Imperial Smelting Corporation, Ltd., St. Andrew's Road, Avonmouth, quoting reference MRL/IM.

APPOINTMENTS VACANT

QUASI-ARC COMPANY, LIMITED, Bilston, Staffordshire, require a Metallurgist or Chemist to take charge of their Automatic Welding Materials Development Laboratory. Experience in the field of automatic or manual electrode development, or otherwise in the welding industry, would be of considerable advantage. Salary according to qualifications and experience. Apply to the Research and Development Manager, stating age, qualifications, and experience.

QUASI-ARC COMPANY, LIMITED, Bilston, Staffordshire, require qualified metallurgists, chemists, and physicists for work connected with the development of metal arc-welding electrodes in their new Research Laboratories. Salaries according to qualifications and experience.

REQUIRED by well-known company in Buckinghamshire, competent metallographer, male or female, with experience in cooling curves, preparation of samples, all microscopic and photographic work. Able to prepare simple reports. Special experience in aluminium alloys and cast structures desirable but not essential. Salary £400-£600 p.a. according to qualifications. Apply stating age, experience, &c., to Box No. 383, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

WELL-ESTABLISHED expanding plant in the Midlands producing alloys and castings of high intrinsic value in the non-ferrous and high-temperature field wish to make the following appointments to their organization :

FOUNDRY MANAGER: Must have excellent technical qualifications together with ability to control personnel and production in a small well-organized foundry. The successful applicant will be expected to concentrate on the improvement of efficiency and foundry processes. This responsible appointment will carry a substantial commencing salary with excellent future prospects.

RESEARCH METALLURGIST with the technical qualifications and experience to build up a research team in a specific project of alloy development. This post offers excellent opportunities in the expanding research department.

WORKS METALLURGIST: Applications are invited from qualified metallurgists with experience in quality control of high-grade small castings. The applicant will be expected to develop and be responsible for a system of metallurgical control throughout the plant.

These appointments qualify for contributory pension and assurance schemes. Applicants should submit full details of qualifications and experience, in confidence to Box No. 384, The Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

SOUTH AFRICAN COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH

METALLURGIST : RESEARCH OFFICER

Applications are invited for a post as Research Officer in the Mechanical Engineering Research Laboratory of the C.S.I.R., Pretoria, South Africa.

The salary scale associated with this post is £780 x 48-£1020 per annum. In addition, a cost of living allowance of £234 per annum is payable to married male officers. Starting salary according to qualifications and experience. Generous leave privileges and five-day week.

Candidates must be in possession of at least an Honours degree in Metallurgy or Metallurgical Engineering, or equivalent qualification. The successful candidate will do research work in the field of ferrous and non-ferrous physical metallurgy.

The successful candidate will be required to furnish a medical certificate of good health and to become a member of the University Institutions Provident Fund. The Council will bear the transportation costs of the appointee and his family from his place of residence to Pretoria.

Further information and application forms are obtainable from the South African Scientific Liaison Officer, Africa House, Kingsway, London, W.C.2.

Applications, giving full details of age, marital status, qualifications, experience, and the names of referees, must reach the Secretary/Treasurer, C.S.I.R., P.O. Box 395, Pretoria, South Africa, before 15 March 1955. A copy of the application must be sent to the South African Liaison Officer in London.

Institute's Arms in Colour

A colour plate (five colours and black) will be published with the next index number of the *Journal*, due for issue in the Spring.

As some members have asked that separate copies of this plate be made available for framing, a limited number of copies will be specially printed for this purpose. The dimensions of the colour block are approximately 6×6 in.

Applications for copies of the Arms in colour should be submitted *at once*, with the appropriate remittance (2s. 6d. each) to cover the cost of printing, packing in cardboard tube, and postage. A sufficient number of copies will be ordered to cover the requirements of members who apply before the issue goes to Press.

"Metallurgical Reviews"

Members who have not already done so are particularly requested to return without delay the reply form recently sent to them with the leaflet announcing the forthcoming publication of *Metallurgical Reviews*.

The Secretary is very anxious to receive a reply from every member, whether he intends to purchase the new periodical or not.